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Cultural Differences in the Self: From Philosophy to Psychology and Neuroscience

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Abstract

Different thinking styles in Westerners and Chinese (analytic vs. holistic) lead to disparities between the two cultures not only in perception and attention but also in high-level social cognition such as self-representation. Most Western philosophers discussed the self by focusing on personal self-identity, whereas Chinese philosophers emphasized the relation between the self and others. Dissimilar philosophical thinking of the self is associated with distinct cognitive styles of self-representation (i.e., the independent self in Westerners and the interdependent self in Chinese). Recent brain imaging studies found that Westerners employed the medial prefrontal cortex to represent only the individual self, whereas Chinese utilized the same brain area to represent both the self and close others, providing neural basis of cultural differences in self-representation. We suggest that the cultural differences in thinking styles between Westerners and Chinese influence both psychological and neural structure of self-representation.

The leading cognitive psychologist Herbert A. Simon posited that 'the fundamental goal of science is to find invariants, such as conservation of mass and energy and the speed of light in physics. In much of science, the invariants are neither as general nor as "invariant" as these classical laws' (Simon, 1990, p. 1). Similarly, classic psychological research is inclined to find universal principles of psychological processes that help to elucidate human behaviors. However, recent psychological studies showed strong evidence for the existence of cultural specific thinking styles and psychological processes. Nisbett et al. proposed that Westerners hold an analytic thinking style that induces more attention to focal objects in a field, whereas Chinese hold a holistic thinking style that leads to more attention to a field or relationships among objects (Nisbett, 2003; Nisbett & Masuda, 2003). The analytic thinking style entails Westerners to value individualism and autonomy, but the holistic thinking style results in a relatively weak sense of personal agency or control but strong attention to relationships among objects in a field in Chinese.

The cultural differences in thinking style extend to high-level social cognition. While social psychological research in the 1980s aimed to find

general principles to interpret human social behaviors, research of cultural variation emerged as a challenge to this approach. For example, Markus and Kitayama's (1991) classic paper on culture and self promoted greatly searching after cultural variation rather than searching after universal laws in social psychology. This paper proposed a well-known theory of cultural differences in self-concept or self-construal, which inspired brain imaging investigation of cultural differences in neural substrates underlying self-representation (e.g., Han et al., 2008; Heatherton et al., 2006; Sui, Zhu, & Chiu, 2007; Zhu, Zhang, Fan, & Han, 2007). The brain imaging findings are consistent with the biocultural co-constructive framework (Li, 2003) and contribute to the emergence of a new discipline – cultural neuroscience (Chiao & Ambady, 2007; Wexler, 2006).

In this paper, we first reviewed the difference in philosophical thinking of the self between Western and Chinese philosophers. We then introduced empirical psychological research that supports Markus and Kitayama's framework of cultural difference in self-construals. Finally, we reviewed recent brain imaging studies that provided neuroscience evidence for cultural influence on neural basis of self-representation.

Cultural Difference in Philosophical Thinking of the Self

'What is the self ?' and 'what is it to be a man?' are the questions asked by philosophers around the world. However, philosophical thinking in different cultures emphasizes different aspects of these questions. Self-identity plays a key role in Western thoughts whereas relationship between the self and others is central to Chinese thoughts.

Traditionally, Western philosophers were interested in finding invariant in the self rather than the relation between the self and others. Self-identity represents the essential feature of the self that does not vary as a function of social contexts. In the Judeo-Christian tradition, this invariant self, or 'real self', was denominated the Soul. 'The theory that the essential self of self-identity is the mind, or self-consciousness, can be traced back to ancient time, but its best-known defender is the philosopher Descartes' (Solomon, 1990, pp. 157–158). In his famous slogan, Descartes (1596–1650) declared that 'I think therefore I am.... But what I am? A thing which thinks' (Descartes, 1912, p. 89). Thus, for Descartes, 'I' refers to mind but not body. John Locke (1632–1704), an English philosopher, argued that the self was memory. David Hume (1711–1776) denied Descartes' claim that the self was within the mind by stating that 'When I turn my attention inward, what I find are specific experiences. I find this or that desire for a drink of water, or a slight headache, or feeling of the pressure of the shoes against my feet, but there is no experience of the self in addition to these particular experiences' (Searle, 2004, p. 291). While agreeing to Hume's argument, Searle (2004) noticed that Hume ignored the fact that all experiences one has at any instant are experienced as part of a single,

unified conscious field, which is the subject of our psychological events and body. This rational self or agent is capable of acting freely and assuming responsibility for actions. The self is a logical or purely formal requirement that we can make sense of the characters of our experiences in addition to the experiences. Baars claimed that we consider 'self as the overall, unifying context of personal experience' and 'one way to think of "self" is as a framework that remains largely stable across many different life situations' (Baars, 1997, p. 154). The subject of our psychological events and body 'has to be an entity, such that one and the same entity has consciousness, perception, rationality, the capacity to engage in action, and the capacity to organize perceptions and reasons, so as to perform voluntary actions on the presupposition of freedom. If you have got all of that, you have a self' (Searle, 2004, p. 297).

Although Locke, Hume, and Searle discussed the self based on Descartes's concept, Solomon claimed that 'it is a matter for serious reflection that in our self-absorbed, individualistic society, so much is written and said on self-realization and individual self-identity, while somewhat less has been written, at least on the same level of self-conscious philosophical profundity, on the nature of our relations with one another. Of course, we know the reason for this; our conceptions of self are such that we tend to think that our real or essential or authentic self is ours and ours alone, while relations with other people are secondary to selfhood and, in some sense, "external"' (Solomon, 1990, p. 178). The Western philosophical view of the self has produced strong influence on psychological research of the self. For example, following Descartes statement of 'I think therefore I am', the father of American psychology, William James (1890), emphasized distinctions between the self as a subject (the 'I,') and the self as an object (the 'Me'). Searching invariants of 'I' has been central to contemporary Western psychological research.

The central topic of traditional Chinese philosophy is men rather than the self. The highest form of achievement of a person 'is nothing less than being a sage, and the highest achievement of a sage is the identification of the individual with the universe' (Fung, 1948/2007, p. 10). Different schools of Chinese philosophers suggested distinct way to achieve this goal. The Confucian-centered philosophy, which has two core concepts, i.e., jen (or ren) or human heartedness meaning loving others and yi or oughtness meaning the material essence of duties in society (Fung, 1948/2007, p. 69), claims that 'a person can not exist alone; all action must be in the form of interaction between person and person' (Hu, 1929/2006, p. 107). According to Mencius, the best way to realize human heartedness is to conduct practice of chung (i.e., loyal) and shu (i.e., pardon or forgive) so that 'one's egoism and selfishness are gradually reduced. And when they are reduced, one comes to feel that there is no longer a distinction between oneself and others, and so of distinction between the individual and the universe' (Fung, 1948/2007, p. 124).

Taoist, another Chinese philosophy, advocates the preservation of life and avoidance of injury. The best way to do this, according to Taoist, is to understand the laws underlying the changes of things in the universe. If one understands these laws and regulates one's actions in conformity with them, he may then take the concept of the identity of self with others or to abolish the self (Fung, 1948/2007, pp. 106–108). Chinese Buddhism takes an extreme view of the world by stating that all things in the world are actually empty, although common people take all things as really existent. All things in the universe are the manifestation of the mind and therefore are illusory and impermanent. The only way to escape from this non-enlightenment, which leads to the eternal Wheel of Birth and Death, is to realize the individual's original identification with the Universal Mind (Fung, 1948/2007, pp. 400–402). In sum, according to ancient Chinese philosophers, 'to be a man' is to become one with Heaven and feel that there is no longer a distinction between oneself and others (Confucianism), to identify oneself with others (Taoism), or to realize the identification of the individual with the Universal Mind or Buddha-nature (Buddhism).

The modern Chinese philosophers inherit traditional thoughts of the concept of a person. For example, Yu-Lan Fung (or Youlan Feng, 1895–1990) considered ren of Confucianism, the Tao of Taoism, and Nirvana (in Sanskrit) of Buddhism to be all the sphere of living (Feng, 2007, pp. 147–149). He combined the thoughts from Confucian, Tao, and Buddhism to propose four spheres of living (i.e., the innocent sphere, the utilitarian sphere, the moral sphere, and the transcendent sphere). Fung asserted that a person is a part of the society who cannot exist without the advance of a society. 'The highest achievement of the man living in the transcendent sphere is the identification of himself with the universe' (Fung, 1948/2007, p. 560). Shi-Ying Zhang (2005) further claimed that the whole universe, including nature, human society and spiritual domain, exists as a net of universal connection on which every thing is but a knot or cross point. 'A person is one of the same cross point, with the only exception that he is able to consciously think of the self, i.e., having self-consciousness and is capable of transcending itself' (Zhang , 2005, p. 83). The existence of the self completely depends on its connections with others. However, men with self-consciousness artificially cut off the relation of their selves to others. When men set out to transcend the division and their self-consciousness, they will realize the 'relational self', and that they must not be set apart in an instant from others. The viewpoint of 'relational self' means non-insistence. That is, without insistence on 'I am myself' we will be able to see other in myself and vice versa (Zhang, 2005, p. 87). Taken together, most Chinese philosophers believed that a person is a social being that cannot exist alone and the highest achievement of a person is the identification of the individual with the universe. The emphasis of human connections with each other in Chinese philosophy has influenced

greatly the concepts of self in Chinese psychology, which adopted the self as one's social role and relations in empirical research (Zhu, 2007, p. 17).

It should be acknowledged that not all Western philosophers referred to the self only in the sense of personal identity and not all Chinese philosophers discussed the self in the sense of personal relations with others. Although exceptions exist, it is true that Western philosophic thought is dominated by seeking invariants in the self whereas Chinese philosophic thought stresses the relations between the self and others. The cultural disparities in philosophic thinking of the self result in remarkable difference in human social behaviors and possibly in the underlying psychological processes including perception, memory, social cognition, etc. Among the psychological processes related to the self, cultural differences in self-construals have been studied extensively during the last two decades, as described in the next section of this paper.

Cultural Differences in Cognitive Processing of the Self

Distinct concepts of the person and philosophical thoughts of the self in different cultures influence greatly psychological research of the self. For instance, Markus and Kitayama (2003) acknowledged that Shweder and Bourne's (1984) inquiry of whether the concept of the person varies across cultures engendered their own theory of culture-based self-construals (Markus & Kitayama, 1991). Kirmayer (2007) noticed that every system of psychotherapy depends on implicit models of the self, which in turn, are based on cultural concepts of the person. Nisbett and Masuda (2003) also discussed extensively the relation between self-concept in psychology and self-concept in philosophy by comparing Western and East Asian cultures. It makes sense to Westerners to speak of a person with attributes that are independent of sociocultural contexts. This self – a bounded, impermeable free agent – can move from group to group and setting to setting without significant alteration. The self in East Asian cultures, however, is connected, fluid, and conditional and can be understood only in his/her relation to others (Nisbett, 2003).

According to Markus and Kitayama (1991), self-construals are different between Western and East Asian cultures. Specifically, they proposed that Western cultures with emphasis of self-identity lead to an independent self who is inclined to attend to self-focused information and attends to the self more than others (including intimate others such as mother). By contrast, emphasis of fundamental social connection in East Asian cultures results in an interdependent self who is generally sensitive to information related to significant others and attends to intimate others as much as to the self.

Markus and Kitayama (2003) further suggested that different self-concepts shape psychological processes that implicate the self. For example, the independent self predicts better memory of information about the self than that about others (Conway, Wang, Hanyu, & Haque, 2005; Markus

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& Kitayama, 1991). This was tested using a self-referential task (Rogers, Kuiper, & Kirker, 1977), in which subjects were first presented with a list of personal traits and asked to judge whether a trait was suitable to describe the self or others. At the end of this encoding phase, subjects were required to recall as many of the words as they could. Typically, self-descriptive traits are better remembered than other-descriptive traits (the self-reference effect) (Klein, Loftus, & Burton, 1989). Interestingly, studies of Westerners found evidence for the self-reference effect over closed others such as mother and best friends (Heatherton et al., 2006; Klein et al., 1989), supporting the dissociation between the self and any others in Western cultures. In contrast to the results of Westerners, Zhu and Zhang (2002) and Qi and Zhu (2002) found that, in the self-referential task, Chinese participants remembered equally well the trait adjectives associated with the self and close others (mother/father/best friend), supporting the existence of the interdependent self in East Asian cultures. Our recent work (Sui et al., 2007) further showed that, relative to Chinese culture priming, American culture priming made Chinese subjects use more independent self-statements and fewer interdependent self-statements to describe the self, illustrating the effects of short-term culture exposure on self-construal and its attendant memory processes.

In a study examining cross-cultural difference in autobiographical memory, Wang and Conway (2004) found that European-American adults frequently focused on memories of personal experiences, provided discrete, one-moment-in-time events unique to the individual, and placed a great emphasis on their feelings and personal roles in the memory events. In contrast, Chinese participants intended to describe memories of social and historical events, provided proportionately memories of generic, routine experiences, and focused on social interactions and the roles of other people. The cultural difference in autobiographical memories lends further support to the difference in memory related to the self between Western and East Asian cultures. The aforementioned studies indicate strongly cultural differences in cognitive processes, they do not rule out the existence of cultural universal features of the self. For example, a recent work showed evidence that trait attributes that render the person unique from fellow in-group members exist in both individualistic and collectivistic cultures (Del Prado et al., 2007), suggesting the presence of the individual self-primacy across different cultures.

Cultural Differences in Neural Basis of Self-representation

Recently, psychologists and neuroscientists have tried to inspect potential neural consequences of the cultural differences in philosophic thoughts and cognitive styles. Cultural influences on functional organization of the brain are evident across the life span development (Li, 2003; Wexler, 2006) and have been documented in object recognition (Gutchess, Welsh,

Boduroglu, & Park, 2006), mental calculation (Tang et al., 2006), language processing (Paulesu et al., 2000; Siok, Perfetti, Jin, & Tan, 2004), perceptual experience (McClure et al., 2004), and music processing (Neuhaus, 2003). The findings support the interplay between biology and culture (Shu-Chen Chiao & Ambady, 2007; Li, 2003); that is, not only does the brain generate and support cognition and sociocultural interactions, but it also works the other way around (i.e., culture shapes and modifies the brain structure and function).

In the self domain, a large number of brain imaging studies showed consistent evidence that the ventral medial prefrontal cortex (vMPFC) is engaged in self-reference processing (Northoff et al., 2006). In addition, recent brain imaging studies found that the neural substrates of self-reference processing are modulated by sociocultural contexts.

A positron emission tomography (PET) study found that, in Danish adults, the medial prefrontal and medial parietal cortices were functionally connected during episodic memory retrieval and interacted with lateral regions that were activated according to the degree of self-reference (Lou et al., 2004). The right inferior parietal region activity showed significant differences both between Self vs. Best friend retrieval conditions and between Self vs. Queen retrieval conditions. The self-referential processing increased the activity in the right inferior parietal cortex, whereas both best friend- and Queen-referential processing resulted in decreased activity in the same brain area. Similarly, Heatherton et al. (2006) found evidence that vMPFC activity differentiated self from best friends in American subjects (see Figure 1), who were imaged, using functional magnetic resonance imaging (fMRI), while making trait adjective judgments in

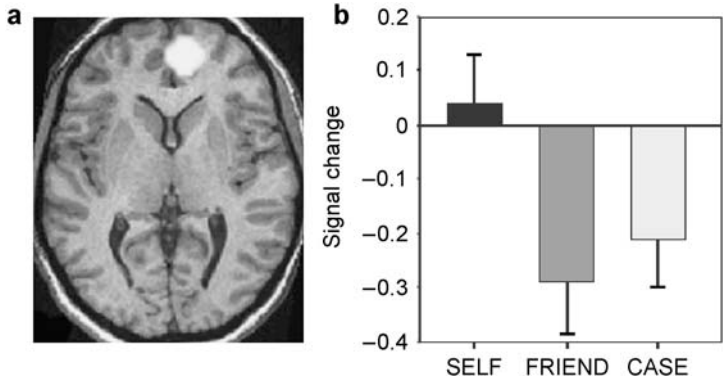

Figure 1 Illustration of the fMRI results from Heatherton et al. (2006). (a) A priori region-of-interest (ROI) in vMPFC was used to compute mean signal change during Self-, Friend, and Case judgments (b) Signal intensities for each condition are plotted relative to the null condition in which no stimulus was presented. vMPFC activity was uniquely sensitive to self judgments. Case-judgment and Friend-judgment produced robust decreases in vMPFC activity that did not differ from each other.

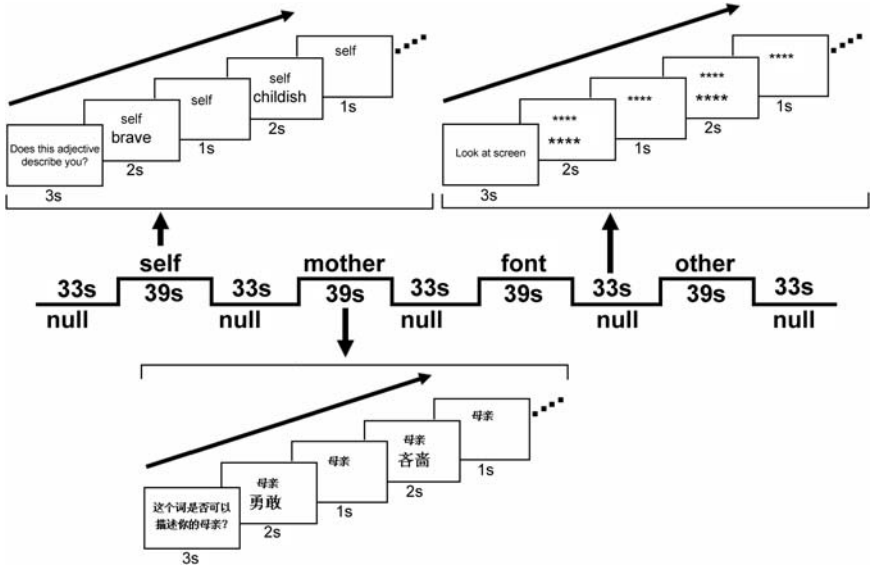

Figure 2 Schema of the design of Zhu et al.'s study (2007). Each trait adjective was presented for 2 seconds and subjects had to judge if each work could describe the self, mother, a public person. Font judgment was used to provide a low-level baseline. The stimuli and procedure of mother, other, and font judgments were the same as those of the self-judgment except that the word 'self' on the screen was replaced by 'mother', 'Bill Clinton' for Western subjects or 'Rongji Zhu' for Chinese subjects, or 'font', respectively. Instructions and trait words were in English for Westerners but in Chinese for Chinese subjects.

terms of the self and a friend. The fMRI results showed that, relative to letter judgment (uppercase vs. lower case), making judgments about the self yielded increased activation in vMPFC, whereas making judgments about a friend did not. The brain imaging results suggest that American subjects used vMPFC to represent exclusively the self.

To uncover cultural differences in the neural basis of self-referential processing, we recently scanned Westerners (English, American, Australian and Canadian) and Chinese young adults, using fMRI, while they performed personal trait judgment regarding the self, mother, or a public person (see Figure 2 for details, Zhu et al., 2007). The subjects also performed a memory retrieval task after the scanning procedure, similar to the previous behavioral research (Rogers et al., 1977; Zhu & Zhang, 2002). Zhu et al. (2007) found that memory of trait adjectives related to self and mother was equally well for Chinese but was better in the former condition for Westerners. The fMRI results showed stronger vMPFC activation in self- than public-person judgments in both Chinese and Westerner, consistent with the previous findings (Kelly et al., 2002). More interestingly, Zhu et al. (2007) found that, relative to public-person judgment, mother judgment also induced stronger vMPFC activation in Chinese subjects but not in

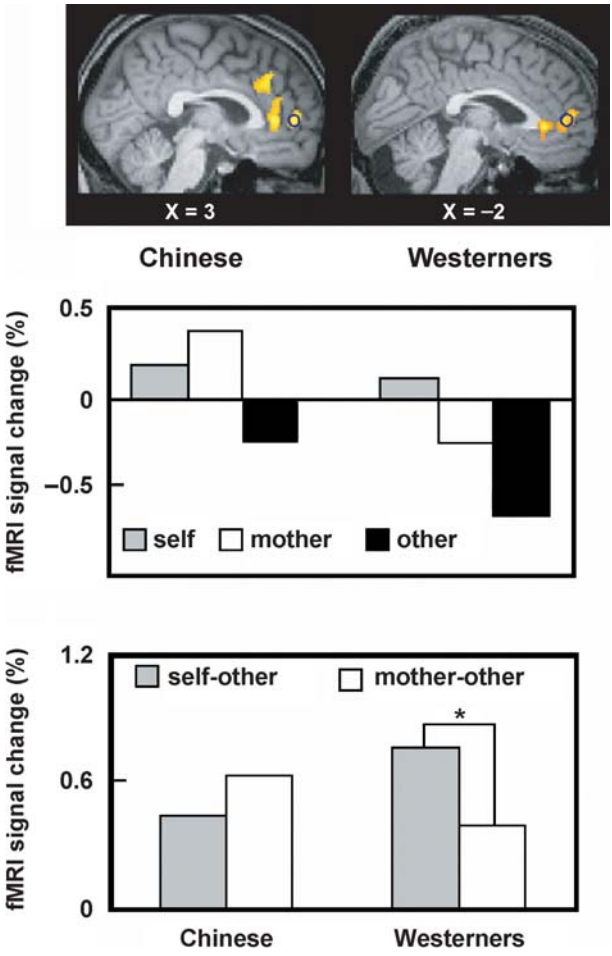

Figure 3 fMRI results of ROI analysis in MPFC from Zhu et al. (2007). (a) Illustration of the locus of vMPFC (marked with blue circles); (b) fMRI signal changes related to self-, mother, and other judgments; (c) Differential percent signal changes (self minus other and mother minus other). The asterisk indicates a significant difference between the self- and mother-reference effects in signal changes.

Western subjects (see the fMRI results in Figure 3). In addition, self-judgment gave rise to increased vMPFC activation compared with mother judgments in Western subjects but not in Chinese subjects. Both the behavioral and brain imaging results support that Chinese individuals use vMPFC to represent both self and mother, whereas Westerners use vMPFC to represent exclusively the self. Similar evidence for the overlap of self- and mother representation in vMPFC in Chinese was reported in Zhang et al. (2006). These brain imaging studies indicate that representations of the interdependent self and the mother overlap in vMPFC, whereas the independent self is exclusively represented

in vMPFC. The vMPFC activity differentiates between the individual self in Westerners and the relational self in Chinese.

Our recent study of self-recognition provided further evidence for cultural influence on neural substrates of self-representation (Sui & Han, 2007). This study used fMRI to assess if self-construal priming can modulate neural activity underlying self-awareness induced during face recognition in one cultural group (i.e., Chinese). The subjects were first asked to read essays containing independent or interdependent pronouns (e.g., 'I' or 'We') in order to prime the independent or interdependent self-styles (Gardner, Gabriel, & Lee, 1999). They were then scanned while they were presented with pictures of self-face or a familiar face and had to judge head orientations (toward left or right) of each face stimulus. fMRI data analysis showed that the right middle frontal activity increased to the self than familiar faces. Moreover, the right frontal activity differentiating between the self and familiar faces was enlarged by the independent relative to the interdependent self-construal priming. The findings indicate that the neural correlates of self-awareness associated with self-face recognition can be modulated by self-construal priming that activates different cultural self-styles. It appears that self-related processing in Chinese can be biased toward either independent or interdependent styles by short-term self-construal priming. Whether this is true for Western adults can be assessed in future work.

Conclusion

In summary, remarkable cultural differences exist in self-concept in philosophic thoughts. Western philosophy emphasizes personal self-identity, whereas Chinese philosophy emphasizes relations between individuals in social contexts. The difference in philosophical thinking of the self is reflected in psychological structure of the self and the neural substrates underlying self-related processing. The cultural difference in self-concept was identified by integrating designs with both culture-sensitive (e.g., mother/father/friend reference) and culture-invariant (self-reference) cognitive tasks. The heavy emphasis on interpersonal connectedness in Chinese culture leads to the development of neural unification of the self and intimate persons such as mother. In contrast, the dominance of the independent self in Western cultures results in neural separation between the self and others. The empirical cognitive neuroscience findings support the view that cultures differ in how the self is conceptualized and experienced (Lutz, 1992). The cultural difference in self-related processing can be understood in the framework that Western sciences emphasize on atoms, molecules, fundamental particles, and biological molecules in order to find ultimate cause underlying things, whereas Chinese notion about the nature is based on 'relation' which hypothesized a self-organized physical world in order to keep its balance (Prigoine, 1986).

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Short Biographies

Ying Zhu graduated with a Chinese equivalent of PhD in psychology in 1966 from Peking University and is now a professor at the Department of Psychology, Peking University. He has been a member of the Executive Committee of Chinese Psychological society since 1989. His research interest focuses on self-related processing by integration of psychology, neuroscience, and philosophy. He has published a number of papers on the self in *Science in China*, *NeuroImage*, *Psychological Science* (in Chinese), and *Acta Psychologica Sinica*. His recent book 'Culture and self' (2007, in Chinese) argues that although there are remarkable differences in self-concept, culture-invariant mechanisms also exist in different cultures. His current research involves both theoretical and empirical research on the self from the viewpoint of cultural neuroscience. As the editor-in-chief, he published another two books titled *Experimental Psychology* (2000, in Chinese) and *Fundament of Psychological Experimental Research* (2006, in Chinese).

Shihui Han is a professor at the Department of Psychology, Peking University. He is the director of the Culture and Social Cognitive Neuroscience Lab and serves as the Chair of the Department of Psychology, Peking University since December 2003. He is an associated editor of *Social Neuroscience* and *Acta Psychologica Sinica* and serves on the editorial board of *Cognitive Neurodynamics* and *International Journal of Magnetic Resonance Imaging*. His research interests cover cognitive and neural mechanisms of visual perception, attention and cultural influence on neural mechanisms of social cognition such as self-referential processing and empathy. He has published over 70 research papers in journals such as *Brain*, *NeuroImage*, *Journal of Cognitive Neuroscience*, *Human Brain Mapping*, *Psychological Science*, *Biological Psychology*, *Brain Research*, etc.

Endnote

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